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10/617,210	07/11/2003	Christian Georg Gerlach	Q76413	3108

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EXAMINER

WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
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2626

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/617,210

Applicant(s)

GERLACH, CHRISTIAN GEORG

Examiner

James S. Wozniak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9 and 11 is/are rejected.
- 7) ☒ Claim(s) 5 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the digital signal processor (claims 7-9) and decoder (claim 11) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

1. **Claims 5 and 10** are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, claims 5 and 10 have not been further treated on the merits.

2. **Claims 1-4, 6-9, and 11** are objected to because of the following informalities:

In claim 1, lines 9-10, “said optimal code vector among said p optimal group code vectors” should be changed to –an optimal code vector among said p optimal group code vectors-- in order to provide proper antecedent basis for this limitation.

In claim 3, “the shape-gain type” should be changed to –a shape-gain type-- in order to provide proper antecedent basis for this limitation.

The remainder of the dependent claims fail to overcome the objection of their parent claims, and thus, are also objected to due to minor informalities.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. **Claims 1-4, 6-9, and 11** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 1 recites the broad recitation "a signal", and the claim also recites "an audio or speech signal" which is the narrower statement of the range/limitation. Also, claim 8 recites the broad recitation "a standard processor", and the claim also recites "a digital signal processor" which is the narrower statement of the range/limitation. Additionally, claim 11 recites the broad recitation "coder and decoder", and the claim also recites "speech and/or audio signal codec" which is the narrower statement of the range/limitation. The remainder of the dependent claims fail to overcome the above noted issues, and thus, are also rejected under 35 U.S.C. 112, second paragraph.

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5. **Claim 4** contains the term “leads exactly to the same result as a standard serial algorithm” which renders the claim indefinite. It is not clear what is meant by “the same result” and what processing is associated with “a standard serial algorithm” that would lead it to produce exactly “the same result”. Thus, because it is not clear what is meant by the term “leads exactly to the same result as a standard serial algorithm”, the metes and bounds of this term are indefinite. For prior art application purposes only, this term is considered nonfunctional descriptive language and given no patentable weight in the below art rejection. It is suggested that this term be canceled from the claim. There is also no antecedent basis for “the same result” in the claims.

6. **Claims 7 and 9** both recite a processor for parallel execution of the method steps. There is insufficient antecedent basis for these method steps because, as noted in the below 35 U.S.C. 101 rejection, claim 1 does not recite any active steps. Also it is indefinite whether “the method steps” refers to what appears to be every intended method step (*by dividing, by simultaneously determining, and determining*), the second of what appears to be method steps, or the concept of parallel codebook searching. If the applicant intends for all three of what appear to be intended steps to be performed in parallel, the examiner notes that this could lead to a possible 112, 1st paragraph issue because the specification makes no mention of performing all of these processing steps simultaneously. Instead, the concept of parallel searching of a codebook (*i.e., what appears to be the intended second step*), is taught in the specification. For the application of the prior art of record, the examiner has interpreted “steps of said method” to mean “said step of simultaneously determining...”. Also, the examiner suggests an amendment changing “steps

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of said method” to –said step of simultaneously determining-- in order to overcome this aspect of the 35 U.S.C. 112, second paragraph rejection.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. **Claims 1-4, 6-9, and 11** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 is drawn to a processing method for determining an optimal abstract vector using a parallel codebook searching algorithm. In order for a claimed invention to be considered statutory under 35 U.S.C. 101, it must be useful and accomplish a practical application. That is, it must produce a “useful, concrete and tangible result” (*State Street*, 149 F.3d at *1373-74, 47 USPQ2d at 1601-02). Since the final result of the claimed invention is an abstract optimal vector and not a tangible real-world output (for example, transmitted speech vectors or a synthesized speech output), claim 1 is directed to non-statutory subject matter. Also, claim 1 does not list any *active steps that the method comprises* (i.e., *the claim recites a method of coding a signal, by dividing, by simultaneously determining, and determining in the preamble, but does not continue to include the steps that the method comprises*). The claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v.*

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Brenner, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966). In order to overcome this aspect of the 35 U.S.C. 101 rejection, the examiner suggests amending the claim to include --the method comprising:-- at the end of line 5 and deleting “by” at the beginning of what appears to be each intended method step. For the application of the prior art of record, the examiner will consider the aforementioned apparent steps to be the intended coding steps that comprise the method. Claim 11 further contains an additional 35 U.S.C. 101 issue in that a coder is claimed that is *capable* of performing a method of claim 1. Since this coder/decoder is only capable of performing the method of claim 1 and not required to perform the method, it does not necessarily produce a “useful, concrete, and tangible result.”

The remainder of the dependent claims further limit rejected independent claim 1, and thus, are also directed to non-statutory subject matter.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. **Claims 1-2, 6-9, and 11** are rejected under 35 U.S.C. 102(b) as being anticipated by Kwan et al (*“Implementation of DSP-RAM: An Architecture for Parallel Digital Signal Processing in Memory,”* 2001).

With respect to **Claim 1**, Kwan recites:

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K code vectors is provided for vector quantization of a signal vector representing a set of signal values of said signal (*codeword vectors corresponding to a speech signal, Section 3.3, Page 344*),

Performing a codebook search for determining an optimal code vector of said codebook, wherein said codebook search is performed in parallel by (*codebook search performed in parallel, Section 3.3, Pages 344-345*):

Dividing the codebook into p codebook groups (*distributing a voice codebook over multiple processing elements, Section 3.3, Pages 344-345; and Fig. 6*);

Simultaneously determining p optimal group code vector each of which corresponds to one of said p codebook groups (*simultaneously determining a lowest error vector match with each divided codevector set, Section 3.3, Pages 344-345*); and

Determining the optimal code vector among the p optimal group code vectors (*finding the closest matching codevector over all of the processing elements, Section 3.3, Pages 344-345*).

With respect to **Claim 2**, Kwan further discloses:

The step of determining said optimal code vector among said p optimal group code vectors comprises evaluating an index of each optimal group code vector uniquely identifying each optimal group code vector within said codebook (*evaluating the closest codevectors over all processing elements, wherein codevectors are identified by a codebook index, Section 3.3, Pages 344-345*).

With respect to **Claim 6**, Kwan further discloses:

The codebook comprises pulse code vectors (*CELP codevectors, which comprise excitation pulse vectors, Section 3.3, Page 345*).

With respect to **Claim 7**, Kwan further discloses:

A processor with configurable hardware and/or with acceleration means specifically designed for said method is used for parallel execution of steps of said method (*digital signal processor (configurable hardware) with parallel processing elements for faster codebook searching (acceleration means), Fig. 6*).

With respect to **Claim 8**, Kwan further discloses:

The processor provides means for simultaneously accessing a plurality of said signal values located in a memory (*simultaneously accessing many stored code vectors in parallel processing elements, Section 3.3, Pages 344-345*).

With respect to **Claim 9**, Kwan further discloses:

A standard processor, in particular a digital signal processor, is used for parallel execution of steps of said method, and wherein said steps of said method are optimized regarding calculation means of said standard processor and/or execution time (*DSP used to perform parallel speech coding with increased speed and efficiency, Section 3.3, Pages 344-345*).

With respect to **Claim 11**, Kwan further discloses:

Coder and decoder, in particular speech and/or audio signal CODEC, capable of performing a method according to claim 1 (*voice coding and decoding, Section 3.3, Pages 344-345*).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 3-4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al in view of Davidson et al (*U.S. Patent: 4,868,867*).

With respect to **Claim 3**, Kwan recites the parallel process for encoding a voice signal as applied to Claim 1. Although Kwan does not explicitly describe the entire encoding process in detail, including a shape-gain step, such a step is well known in the speech coding art as is evidenced by Davidson (*Col. 16, Lines 32-56*).

Kwan and Davidson are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Kwan with the well known gain factor taught by Davidson in order to provide information required for speech synthesis at a decoder that also minimizes distortion in a reproduced speech signal (*Kwan, Col. 3, Lines 7-18*).

With respect to **Claim 4**, Kwan discloses the comparison of the best codevectors of each processing element to determine the overall best codevector, as applied to Claim 1 and also shown in Fig. 7. Kwan does not explicitly disclose the well-known comparison expression for comparing codevectors recited in Claim 4, however Davidson recites this well-known expression

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for the benefit of providing a comparison scheme suitable for a DSP that has low memory requirements (*Kwan, Col. 12, Lines 15-59*).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Fette et al (U.S. Patent: 6,199,040)- teaches a method for performing a codebook search by searching subcodebooks.

Gao et al (U.S. Patent: 6,556,966)- discloses a method for determining an optional code vector by comparing subcodebook vectors in series.

Kandhadai et al (U.S. Patent: 6,789,059)- discloses a method for searching subcodebooks rather than an entire codebook.

Ngwa-Ndifor et al ("*A Fast Search Algorithm for Speech Vector Quantization*," 1992)- discloses that speech codebook searching can be applied in a parallel environment for very fast encoding.

Wang et al ("*DSP-RAM: A Logic-Enhanced Memory Architecture for Communication Signal Processing*," 1999)- teaches that parallel processing elements may be used in a codebook search for coding speed-up.

Cuhadar et al ("*A Scalable Parallel Approach to Vector Quantization*," 1996)- teaches a parallel approach for image coding utilizing subcodebooks.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632.

The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
3/7/2007


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